Managing the Lambing Enterprise

A Senior Project

presented to

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of the Requirements for the Degree

Bachelor of Science

by

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1. Introduction

Sheep have been domesticated for approximately 10,000 to 12,000 years and were among the first animals to be tamed by humans; along with the goat and the dog (1). Today sheep are mainly used for wool and meat production. In order to make a profit from raising sheep, the ewes need to be bred and the lambs need to be sold after they are weaned.

1.1 General Summary of the Lambing Process

Breeding sheep is a process that needs preparation before it can be accomplished, the prepping process before the breeding season is called pre-breeding. Pre-breeding entails getting the ewes and rams ready for breeding. This includes gathering your sheep and sending them through a chute system and into a corral so that an accurate head count can be made, evaluating ewes and rams to make sure that they are healthy and are in the right body condition to breed, vaccinating and deworming according to your health plan protocol, trimming hooves, tagging or shearing sheep and flushing the ewes (2-4, 6). An animal's body condition is determined by using the body condition score system, the scale ranges from 1 to 5; 1 means the animal is emaciated while 5 means the animal is obese. Ewes and rams before breeding should ideally be between a 2 or 3 body condition score going into the breeding season (4). Tagging is the process of only shearing the wool by the ewe's dock, tail, this makes being bred by the ram easier; shearing is the whole process of taking all of the wool off of the sheep. Another term that is used in regards to shearing sheep is crutching, which is the shearing of only the wool off of the dock, udders and vulva area of the ewe to make the lambing process cleaner. Whether you tag, crutch or shear the ewes is all up to the preference and experience of the owner. Flushing is the term used when you put the ewes on lush pasture or on good quality grasses or feed a small amount of grain every day for a month to a couple of weeks before you start breeding. This ensures that the

ewe is in the right body condition needed to conceive and also increases ovulation as well. An increase in ovulation guaranties that more lambs will be born during the lambing season due to ewes having multiple offspring (2-4, 6).

The breeding season for sheep is in the fall, mid-August to mid-November. Ewes start cycling when the weather starts getting cooler. Sheep are seasonally polyestrus, meaning that they have multiple estrous cycles within their breeding season. Their estrous cycle ranges between 13-19 days, with the average cycle happening every 17 days. There are different breeding systems that you can use to breed sheep; these include field mating, hand mating and artificial insemination. Field mating is just letting the ram out with your entire ewe flock. Hand mating involves putting a ram out with a specific smaller group of ewes from your flock. Artificial insemination is the most expensive option and involves inserting ram semen that is in a pipette into the reproductive tract of the ewe; this is mostly used by hobby and show sheep breeders. Whether you are using the field or the hand mating system to breed, the ram should be left in with the flock for a couple of estrous cycles to make sure he has had a chance to breed all the ewes at least once within the time frame that he is with them. Gestation length for sheep is 144 to 152 days with the average length being 148 days, which is roughly 5 months. After the ewes are bred and the ram is taken out of the flock, the ewes should be kept on good feed throughout the entire gestation period. Near the end of gestation is when the ewes have the most energy and nutritional needs because that's when the lambs are growing the most and when their mammary glands are starting to produce milk for the new lambs. Grain can be feed to the ewes to provide the extra energy or have a mineral block available to provide the ewes with the extra vitamins and minerals that she can't attain from the pasture by grazing it (2-6).

Lambing time is an exciting and rewarding event to take part in. Lambs can be born out in the pasture or inside a barn, in either case lambing pens, jugs, should be constructed in the barn to be used during the lambing season. The jugs consist of four panels that are connected together to form a square pen, straw should be put on the floor within the pen and when a ewe and her lambs are placed in one make sure the ewe has access to water and has hay to eat. If lambs are born outside the lambing pens are only used when a situation arises when placing a ewe and her lambs in one is necessary, with lambs that are born inside a barn the pens are always occupied with ewes and their lambs. Signs of lambing are the following 24 hours before lambing starts, the ewe's abdomen will drop producing a triangular-shaped hollow in front of the hips and the udders will start filling up with milk as well. 6 – 12 hours before lambing, the ewe will appear restless, walk around a lot to find a place to have the lambs, paw at the ground, and stand up and lie down frequently. 1 – 3 hours before lambing, the ewe will appear more restless, get up and down more frequently, may roll on her side and paddle the air when contractions start, and/or point nose into the air and grunt or strain. There are three distinct stages that the ewe will go through when she is delivering lambs. Stage 1 is myometrial contractions and cervical dilation, contractions will start, the cervix dilates, water bag emerges and breaks; this can last up to 2 – 6 hours. Stage 2 is fetal expulsion, a lamb appears about 30 minutes after water bag breaks, if ewe has multiple lambs the next lamb should follow the first one about 20 – 30 minutes afterwards; this can last up to 30 minutes – 1 hour and a half. Stage 3 is fetal membrane expulsion, the amniotic sac, amber in color, emerges and is released; this happens 5 – 8 hours after the last lamb is born. After the lambs are born the ewe should lick them clean of fetal membranes and let them nurse on her. It is important for lambs to nurse after they are able to stand because the milk from the ewe for the couple of days after lambing, colostrum, is

especially rich with proteins, sugars and antibodies that are necessary for the lamb to receive in order to survive (2-6).

There can be complications with the lambing process but this is an occasional happening because most of the time mature ewes have no trouble delivering lambs. Ewe lambs on the other hand are the ones that might have the complications since they have never lambed before. Difficult lambing or dystocia happens because the cervix is not fully dilated, the lamb is in an abnormal position, or lamb is too large for the ewe. Assist the ewe in deliver only after the ewe has been in labor for 30-45 minutes with no progress being made. Catch ewe and lay her on her side before assisting. The normal positions for lambs to be in are with head and both front feet first or with both hind legs first. The abnormal positions that lambs could be in are having both front legs first with no head, one front leg back, two lambs at once, rump first (breech), and upside down with one leg back. All of these positions require the lamb to be put in a normal lambing position again before it can be pulled out. In order to get the lamb in the proper position the lamb has to manually put in that position by the person that is assisting the ewe. When the lamb is ready to be pulled, take hold of the lambs legs and gently pull when the ewe strains to help her in the delivery process (2-4, 6).

Complications that can happen after lambing are, the lamb isn't breathing in that case place lamb by ewe's head and let her clean the lamb off, wipe the membranes off the lambs face yourself, poke the lamb's nose with a stick to get it to sneeze, lightly hit or rub on the lamb's ribs with your hands to get it to cough, and/or pick up a hind leg and swing lamb in air a few times to get the lambs circulation going. A lamb could be weak or chilled, when this happens get the lamb to nurse so it can receive colostrum or tube feed it colostrum, make sure the ewe tends to it, and then let nature take its course. A ewe could refuse to accept a lamb, in that situation you can

graft, cross foster, the lamb onto a ewe by using the slime method; which is rubbing birth fluids or meconium (first bowel movement) from ewe's first lamb onto the lamb you want to be excepted so that the lambs smell the same and she accepts both of them. Other methods to graft a lamb onto a ewe are: brine method, involves rubbing salt water on the lambs and on the ewes nose so she can't tell the difference in smell between the lambs and accepts them; skin method, if the ewe has lost a lamb you can skin the coat of a dead lamb and tie it onto the lamb that you want to be accepted by the ewe; or restraint method, which is confining a ewe in a pen in the barn and keeping her there until she accepts the lamb. A ewe could also refuse to let lambs nurse on her, in that case put ewe and lambs in a pen and tie her up so the lambs can nurse freely. When the lambs are done nursing untie the ewe and provide her with some hay and water, tie her up a few more times to let the lambs nurse until she allows them to nurse on her without a problem (2-4, 6).

Before the lambs are weaned off their dams, the lambs must go through the marking process which entails docking tails and castrating the ram lambs and in some sheep operations vaccinations and branding is a part of it as well. If lambs are born inside a barn this is usually done before the ewe and lambs are turned out on pasture, if lambs are born out in pasture then this is done after the last lamb is 2-4 days old so that all the lambs can be done at once. Docking tails can happen as early as 2-4 days of age up to 2 months of age without causing too much trauma or stress to the lamb, the different tools used to accomplish this are: the knife, the burdizzo, the elastrator, or the hot iron/hot dock. Lambs are restrained by another person during this process, with the knife you hold the tail firmly in place and then cut the tail off just below the skin flap that is underneath the tail. The burdizzo is a clamping tool that you use to clamp the tail that then allows you to cut the tail off with a knife. Elastrator is a rubber band that is placed

on the lamb's tail; it cuts off the blood circulation and the tail tissues dies and sloughs off. You can either wait for the tail to slough off by itself or you can cut it off a week or two after the elastrator was placed on the tail. With the hot iron/hot dock, it is heated up with electricity before it is used, it is a clenching tool that clamps and cuts all in one motion. Which method is used depends on the preference an experience of the owner. All of these methods except for the elastrator cause some degree of bleeding, but the wound heals up in a timely manner that doesn't cause the lambs any problems afterwards. The reasons to why this is done are for health/sanitation and market demand. Long tails trap feces and urine under the tail that make an ideal environment for flies to lay their eggs thus turns into the lamb getting fly strike, so to prevent this from happening the tails are cut short. Tails do not provide any extra value to the lamb carcass so there is no need to have them present during the marketing process and short tails also give the appearance of a more level back on sheep which is an appealing trait in the show sheep circuit; if the tail is cut too short though there can be a problem with rectal prolapse in some sheep (2-4, 6).

Castrating ram lambs can happen as early as 2-4 days of age up to 2 months without causing too much trauma or stress to the lambs, different tools to do this are: the knife, the elastrator, the emasculatome, and chemical/short scrotum/vasectomy. Using a knife, you cut the scrotal sac open with the knife then you can either use a pulling tool or your hand to pull out the testes. The elastrator is a rubber band place around the scrotal sac and is dealt with in the same way as with docking tails. Emasculatome is a surgical tool used on large mature rams, the scrotal sac is opened first then the testes cords are crushed and cut with the tool. Chemical/short scrotum/vasectomy are techniques that prevent sperm from being produced without losing testosterone production; is used to create teaser rams. Which method is used depends on the

preference and experience of the owner. Reasons for castrating are to stop secondary sex characteristics from developing that make the carcass oilier and have a stronger taste compared to castrated ram meat, stop fighting amongst the ram lambs and prevent injuries that can arise from fighting and to prevent unwanted pregnancies in the ewe lambs before they are ready to be bred (2-4, 6).

Weaning takes place as soon as 30 days up to 6 months after lambs are born, it is the process of separating the lambs away from the ewes, which helps to stop the lactating process in the ewes. When this occurs depends on what lambing market you are planning to sell your lambs in; early spring, spring, summer or fall. There are different ways to wean lambs as well, there is cold turkey, gradual, fence line and nose rings methods. Cold turkey is separating the lambs and ewes into two different pastures some distance away from each other, there will be a lot of noise from both lambs and ewes at first but eventually they will quite down; also make sure your fences are in good conditions to hold the sheep in the pasture during the transition time. Gradual is when you put the ewes on lower nutritional feed a couple of days before you wean to begin stopping the lactation process naturally. Fence line is simply putting the lambs and ewes in two different pastures that are right next to each other so that the lambs can still have contact with their dams. The nose ring method involves putting nose rings on the lambs that have spikes on them; the lambs cause pain to the udder when they nurse on the ewe and she doesn't let them nurse on her as a result. Which method is used to wean depends on the preference an experience of the owner. Concerns during weaning time are that the ewe can develop mastitis, mammary gland infection, if it is done too soon after lambing and there can be a lot of emotional stress for ewes and lambs during this time which can cause them to get sick. Both of these situations can increase

production costs, since medicine for treatment needs to be bought as a result of weaning lambs too soon (2-4, 6).

1.2 Cal Poly Sheep Flock Information

The Cal Poly sheep flock consisted of 100 ewes, 80 mature ewes and 20 ewe lambs, at the beginning of breeding season. Mature ewes and ewe lambs were kept in separate pastures. The ewe lambs were grazing on the irrigated pastures to ensure that they received enough nutritional feed to promote growth and development. While the mature ewes were grazing on the non-irrigated pastures and then were put onto good pasture of the South Hill fields in August, to induce flushing a month before they were bred in September. The ram used for breeding was introduced into the flock of mature ewes on September 14th, and the ewe lambs were incorporated into the main flock at the beginning of October so that they could be bred as well; the ram was removed from the flock on November 21st. All of the ewes were tagged on January 15th before the lambing season started. The first lamb was born on February 5th and the last lamb was born on May 9th. In a normal lambing season our ewes are generally done lambing at the end of March. This year the lambing season ended in May because the ram was kept in with the ewes until mid-November. If a ewe happened to be bred during her first heat cycle and then lost her lamb early there would be ample time to be re-bred by the ram on her second or third heat cycle, before the ram was removed from the flock. Or if a ewe started her heat cycle later in the fall there would be time to be bred by the ram as well. There were a total of 210 lambs born during the lambing season. The lambs were weaned on May 15th except for the lambs that were born after April 22nd; they were allowed to stay with their dams. The total count of lambs alive at weaning time was 176. Eight of the lambs were sold to customers who wanted lambs in April and the other 26 lambs either died from hypothermia or coyote attack. There were more lambs

that died of hypothermia because they couldn't stay warm, due to the rain storms that came through the area in February, then coyote attacks. The lambs are currently grazing on the irrigated pastures while the ewes are grazing on the non-irrigated pastures.

2. Lambing Enterprise Management

For my senior project, I was in charge of running the Lambing enterprise and managing the sheep during the lambing season this year. My responsibilities were to lead all the class meetings the enterprise had in January before the enterprise actually started, coordinating shifts for the daily checks, and made sure all the pastures were secure ahead of time before the sheep were moved into them. For the class I made a general outline of what topics were going to be covered at each meeting, made handouts for the students, made a calendar for students to sign up for shifts with their groups and made monthly schedules of what pastures the sheep were going to be in, which also included work days coming up and other things that needed to be done for the month.

2.1 Grazing Plan Chart

The first step in planning for a lambing season is to make the grazing chart, which maps out all of the pastures the sheep will be grazing in for a given time frame. Lambing season is during the open grazing chart period, which corresponds to the growing season for plants and runs from January to May. The chart was made in advanced in October. Ewe lambs and mature ewes are kept in separate pastures and have different symbols on the chart. The ewe lamb pastures are designated with a double line mark and the mature ewes pastures are designated with a single line mark. In order to make sure that none of the pastures are overgrazed and that they have enough recovery time for the plants to grow back between each grazing, the outline on the grazing chart is followed without too many deviations from the original plan.

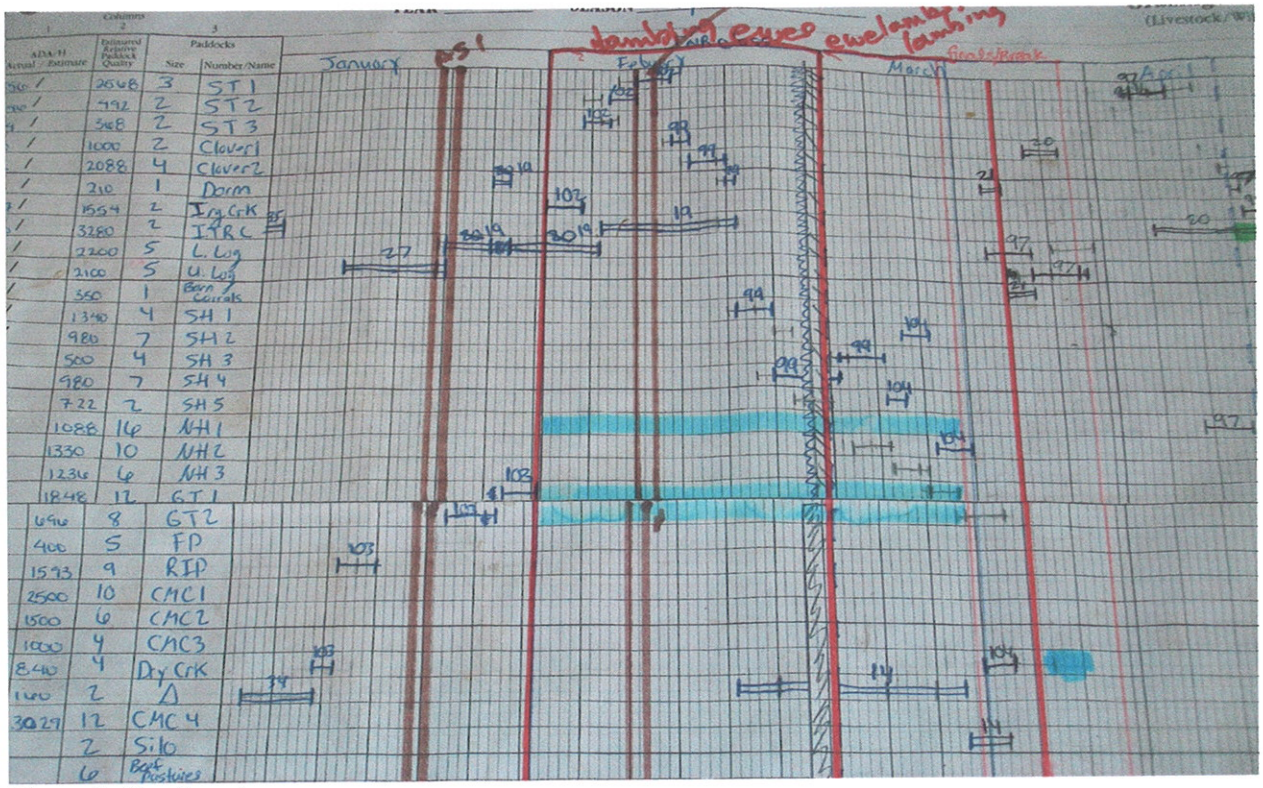

Figure 1: Grazing plan

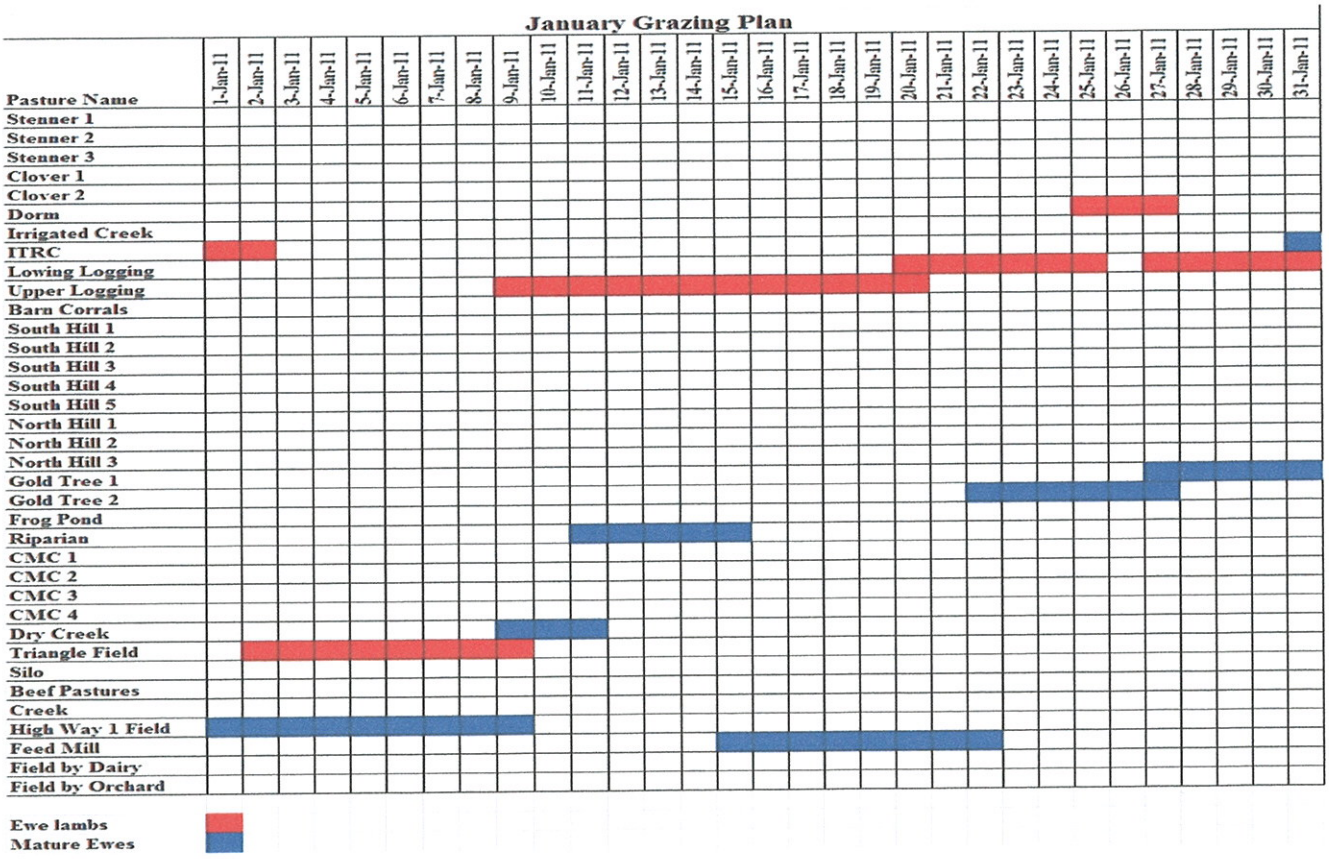

Figure 2: Breakdown of grazing plan for January

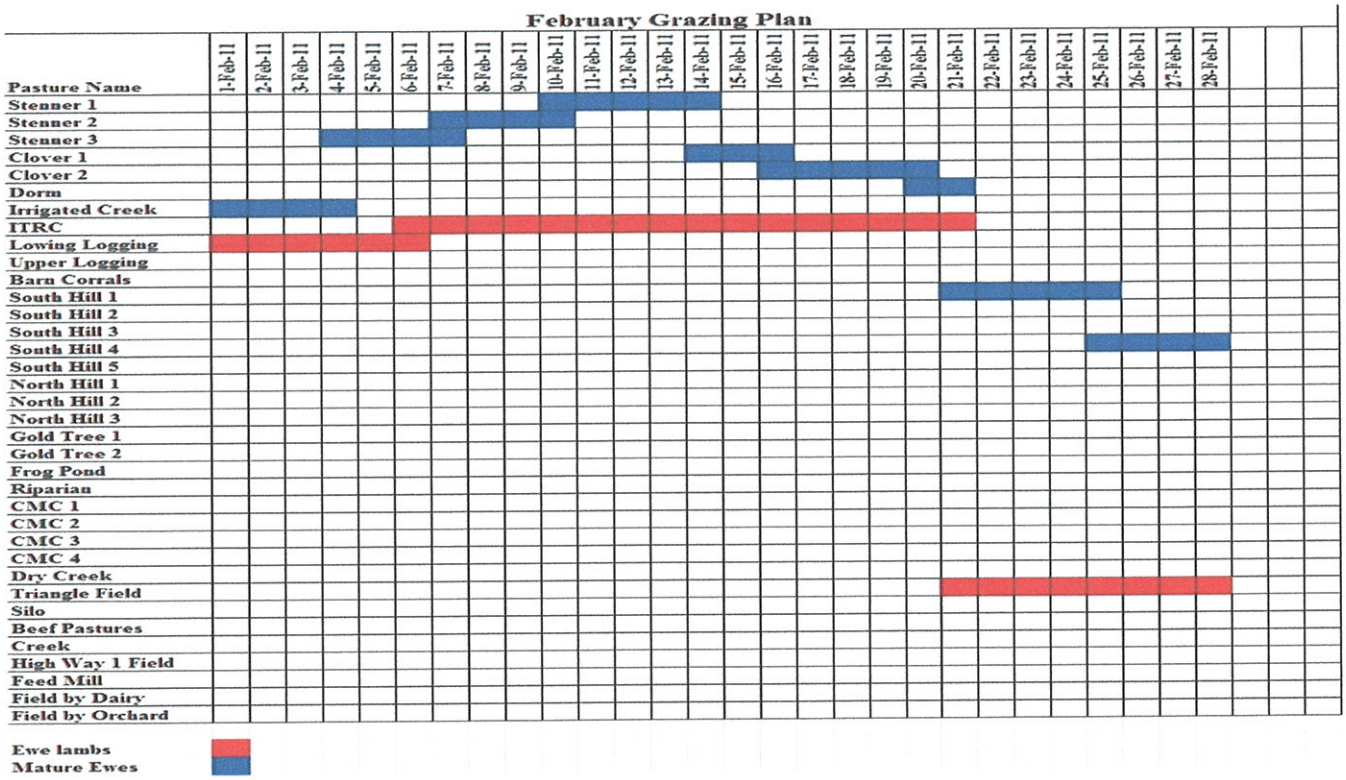

Figure 3: Breakdown of grazing plan for February

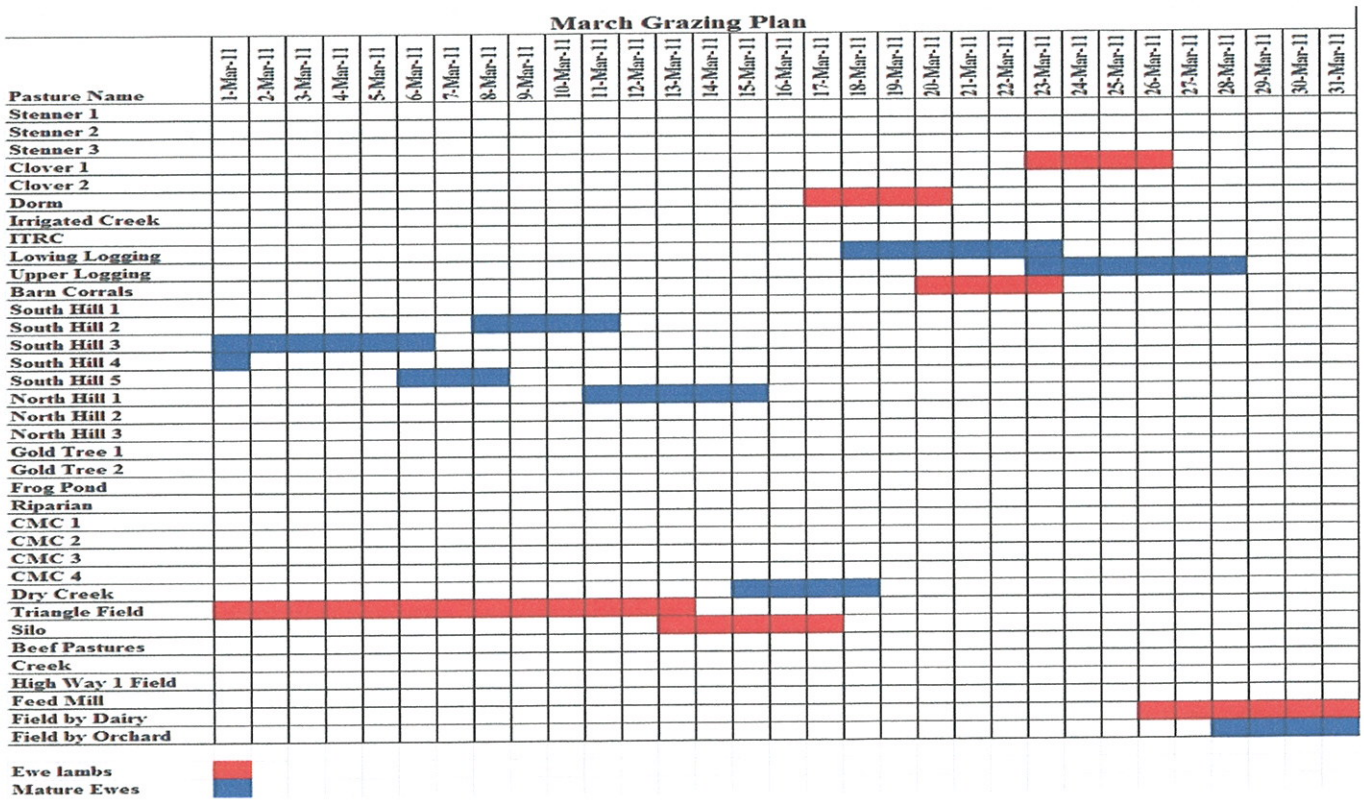

Figure 4: Breakdown of grazing plan for March

2.2 Lambing Enterprise

The lambing enterprise comprised of checking on the sheep two times a day, a morning check at 6:30am and an afternoon check at 3:00pm. On each check the students brought the lambing bucket with them, the bucket contained items that the students would need to process the new lambs born. The record book contained pages that the students filled out which included the ewe's number, lamb's number, lamb's weight, lambs sex, comments and a place to record the day the lamb gets marked; an ear tag applicator and ear tags for ear tagging lambs, a scale to weigh the lambs, a bottle of iodine to dip the umbilical cord in, and a fence tester to determine if the pasture fences are on and working. The comments section was used to write down important information about an individual ewe that others should be aware of, like information about the mothering ability of the ewe, if the ewe has mastitis, or if the ewe has udder issues. Either I or my co-worker went out with the groups to explain and show how to process lambs, oversee the students and to make sure everything was alright with the sheep. In addition to checking for new lambs, the students also helped with herding the flock to new pastures and building temporary fence to secure a pasture for the sheep to graze in during the enterprise (4).

Figure 5: Lambing Bucket

Figure 6: Lambing Bucket

2.2a Enterprise Class Outline:

Lambing Enterprise Class Outline

First class – Jan 4th 7am

- Introductions
- Explanation of the enterprise
- Give out permission numbers
- Pass out note cards to start forming groups
- Questions

Second class – Jan 11th 7am
(Bring calendar and lambing bucket)

- Go over normal lambing handout: checking the pasture, signs of lambing, lambing process, and after lambing
- Groups and fill out calendar
- Questions

Third class – Jan 18th 7am
(Bring calendar)

- Go over abnormal lambing handout: dystocia and complications after lambing
- Announcement: first work day Jan 22nd – take down fencing in highway 1 field, set up lambing jugs and move ewes
- Groups and fill out calendar
- Questions

2.2b Class Handouts:

Normal Lambing

Checking the Pasture:

- Bring lambing bucket with you on each check
- Survey the pasture for the sheep, walk around it to find new lambs or ewes in labor
- If there are new lambs, go up to the ewe and her lamb(s) and record the ewe number, lamb number after you ear tag it, weight of the lamb(s), sex of the lamb(s) and dip the umbilical cord in iodine solution (4)
- If there is a ewe in labor, observe her to see if she is in need of assistance; if not let her be and wait for lambs to be born before approaching them (4)
- Make sure the sheep have water and a mineral block
- Check fence to see if it is on and working properly

Signs of Lambing:

- 24 hours before lambing starts: the ewe's abdomen will drop, producing triangular-shaped hollows in front of the hips (2)
- 6 – 12 hours before lambing: ewe will appear restless, walk around, paw at the ground, and stand up and lie down frequently (2)

- 1 – 3 hours before lambing: ewe will appear more restless, get up and down more frequently, may roll on her side and paddle the air when contractions start, and/or point nose into the air and grunt or strain (2)

Lambing Process:

- Stage I – myometrial contractions and cervical dilation: contractions start, cervix dilates, water bag emerges and breaks; lasts 2 – 6 hours (4,5)
- Stage II – fetal expulsion: lamb appears 30 minutes after water bag breaks, if ewe has multiple lambs next lamb should follow the first one 20 – 30 minutes afterwards; lasts 30 minutes – 1 hour and a half (4,5)
- Stage III – fetal membrane expulsion: amniotic sac, amber in color, emerges and is released; happens 5 – 8 hours after the last lamb is born (4,5)

After Lambing:

- Ewe should go over to lamb and lick it clean of fetal membranes (4)
- After the lamb is clean the ewe should let it nurse (4)
- Can dock tails as early as 2-4 days of age up to 2 months of age without causing too much trauma or stress to the lamb (2-4,6)
- Can castrate ram lambs as early as 2-4 days of age up to 2 months without causing too much trauma or stress to the lamb (2-4,6)
- Weaning can occur anywhere from 30 days to 6 months after lambs are born (2-4,6)

Abnormal Lambing

Dystocia – difficult lambing:

- Reasons: cervix is not fully dilated, the lamb is in an abnormal position, or lamb is too large – in the case of a ewe lamb lambing for the first time (4)
- Assist only after the ewe has been in labor for 30-45 minutes with no progress being made (2,4)
- catch ewe and lay her on her right side before assisting her (4)
- normal positions: head and both front feet first or both hind legs first (2)
- abnormal positions: <u>both front legs no head</u> – reach inside and push the lamb back until there is enough room to move the head forward; <u>one front leg back</u> – reach inside and push the lamb back until there is enough room to move the leg forward; <u>two lambs at once</u> – reach inside and push one of the lambs back so the other one can come out; <u>rump first (breech)</u> – reach inside and push the lamb back until there is enough room move the hind legs forward; <u>upside down and one leg back</u> – reach inside and push the lamb back until there is enough room to turn it around and bring the head and front legs forward (2,4)
- once you have the lamb in a proper position, take hold of both of the lambs front legs and pull gently when the ewe strains (2)

Complications after lambing:

- lamb isn't breathing: place lamb by ewe's head and let her clean the lamb off, wipe the membranes off the lambs face, poke the lamb's nose with a stick, lightly hit or rub on the

lamb's ribs with your hands, and/or pick up a hind leg and swing lamb in air a few times (2,4)
- weak/chilled lamb: get the lamb to nurse so it can receive colostrum or tube feed it colostrum, make sure the ewe tends to it, and let nature take its course (4)
- ewe refuses to accept a lamb: graft lamb to ewe through the slime method – rub birth fluids or meconium (first bowel movement) from ewe's first lamb onto the lamb you want to be excepted or put her in a stanchion in the barn until she accepts the lamb (4)
- ewe refuses to let lamb(s) nurse: bring ewe and lamb(s) down to the barn and put her in a stanchion so the lamb(s) can nurse freely (4)

2.2c Monthly Schedules:

January Schedule

Ewe Lambs
ITRC Jan 1st – 2nd (take down fencing)
Triangle field Jan 2nd – 9th
Upper Logging Jan 9th – 20th (build and take down dividing fence)
Lower Logging Jan 20th – 25th
Dorm Jan 25th – 27th
Lower Logging Jan 27th – Feb 6th

Ewes
Highway 1 field Jan 1st – 9th (take down fencing)
Dry creek Jan 9th – 11th
Riparian Jan 11th – 15th
Feed mill Jan 15th – 22nd (build and take down fencing)
Gold Tree 2 Jan 22nd – 27th
Gold Tree 1 Jan 27th – 31st

Other
Tag Ewes Jan 15th
Work day Jan 22nd – take down fencing in highway 1 field, set up lambing jugs, and move ewes
Work day Jan 29th – demo how to build and trouble shoot temporary net fence

February Schedule

Ewe Lambs
Lower Logging Jan 27th – Feb 6th
ITRC Feb 6th – 21st (build and take down fencing)
Triangle Field Feb 21st – March 13th

Ewes
Irrigated Creek Jan 31st – Feb 4th (build and take down fencing)
Stenner 3 Feb 4th – 7th (build fencing)
Stenner 2 Feb 7th – 10th (take down fencing)
Stenner 1 Feb 10th – 14th
Clover 1 Feb 14th – 16th

Clover 2 Feb 16th – 20th
Dorm Feb 20th – 21st
South Hill 1 Feb 21st – 25th
South Hill 4 Feb 25th – March 1st (build fencing on North end of pasture)

Other
Work day Feb 6th – demo how to build and trouble shoot temporary fence, net and poly wire
Work day Feb 12th – clear weeds from Clover and Dorm pastures
Make sure fences are staying hot and energizers are working properly

March Schedule

Ewe Lambs
Triangle Field Feb 21st – March 13th
Silo March 13th – 17th
Dorm March 17th – 20th
Barn Corrals March 20th – 23rd
Clover 1 March 23rd – 26th
Field across from the Dairy March 26th – April 6st (build and take down fencing)

Ewes
South Hill 4 Feb 25th – March 1st (build fencing on North end and East side of pasture)
South Hill 3 March 1st – 6th (take down fencing)
South Hill 5 March 6th – 8th
South Hill 2 March 8th – 11th
North Hill 1 March 11th -15th
Dry Creek March 15th – 18th
Lower Logging March 18th – 23rd
Upper Logging March 23rd – 28th
Field by the orchard March 28th – April 15th (build and take down fencing)

Other
Work Day March 6th – marking lambs: dock tails and castrate
Make sure fences are staying hot and energizers are working properly

3. Risks and Safety Issues

The animal science department requires all students working with animals for a class within the department to fill out a safety packet which includes a health insurance information form, identified risks of participation form, and a release agreement form. The health insurance form is just for general information about your health insurance and asks for an emergency contact in the event that you do get injured. Identified risks of participation lets you know that it

is your responsibility to work in a safe manner around the animals. The release form protects the school against any lawsuit that could be filed if a student happened to get injured while working with the animals on campus. In addition to signing the safety packet, if any of the lambing enterprise students wished to learn how to operate the pick-up, ATV or tractor during the enterprise; they had to sign other forms that are found in the Sheep Unit safety manual in the office after they were trained and approved to operate the equipment. The safety manual contains the following documents: employee safety checklist, approved operators page, general safety guidelines from the Cal Poly State University safety manual, ATV checklist, tractor checklist, pick-up checklist and MSDS forms. In the event that an enterprise student did get injured on a check there is a first aid kit available in office and emergency contact numbers for the campus located in the safety manual as well.

4. Fencing and Equipment Upkeep

There are two types of fencing at the sheep unit, permanent and temporary fence that are electrified by an energizer. The permanent fence is what surrounds all the main pastures around the unit. Temporary fence is used to subdivide big pastures for the lambs to extend the grazing time in that pasture or to fence off a pasture that isn't total surround by permanent fence like some of the pastures near the creek or to secure parts of the crop unit fields which the sheep are allowed to graze every once in a while. The fencing should be checked regularly to ensure that it is on and working properly. To check the permanent fence, first check the energizer in the office to make sure it is on and working and that there are no alarm sounds coming from it. If there is an alarm sound, check the display screen on the energizer to see what the problem is. The different display codes that could appear on the screen to indicate that there is a problem with the energizer are the following: output alarm (OA), fence alarm (FA), earth alarm (EA), electrical

interference (7.5), energizer standby mode (= =), energizer error (E8), abnormal operation (E10), and installation error (E16).

An output alarm means that the fence is heavily loaded and there is a short somewhere in the fence, to fix this you must check the fence for shorts and/or remove excess vegetation that is on the fence. The permanent fence is an eight wire fence which alternates between hot and ground wires. Most of the problems occur at the H braces of the fence, where there is support wires holding the fence posts in place that could potential come in contact with a hot wire and short out the fence or if there is too much vegetation leaning on the bottom hot wire this could also short out the fence. To check for shorts in the fence, take a fence tester with you and walk around the pastures near the energizer first to see if the problem is in those pastures before checking the pastures farthest away. Check the H braces first to see if any of the hot wires are in contact with a support wire or a ground wire, if that is the case separate the wires from each other to stop the short. Another indicator that there is a short somewhere is a popping sound. As you walk to the next H brace listen for popping sounds along the fence and check that area of the fence for shorts if you hear a pop sound. To check the voltage of the fence between the H braces, place the fence tester on any of the hot wires of the fence and press down on the button. If there is a change in voltage between sections of the fence, it indicates that there is problem somewhere along this particular section of fence. Keep walking along the fence and checking until you think you have solved the problem, then go back to the office and check the energizer. If the problem is fixed you will not hear the alarm sound anymore, if the problem is not fixed the next thing to do if there was no problems at any of the H braces is to push down vegetation from the bottom hot wire.

A fence alarm means that the fence is either heavily loaded and has a short in it or has excess vegetation on it and/or there is a break somewhere in the fence. To go about fixing this problem, process with checking for shorts in the fence for an output alarm but at the same time check to see if any of the fence wires are broken as well. If there is a break in the fence, turn the switch for the particular section of fence off or unplug the energizer before proceeding to fix the break. The break can be fixed with a wire connector piece that connects the broken ends of a wire together and is found in the big barn where all the fencing supplies is located. An earth alarm means that there is something wrong with the ground field, to fix this problem the wires going to the ground field need to be checked and reconnected if they are disconnected. An electrical interference problem is usually self-corrected by the energizer after the interfering signal goes away. Energizer standby problem can be fixed by unplugging the energizer cord and waiting a few seconds before plugging the energizer cord back into the socket on the wall. An energizer error issue is fixed by calling the Gallagher fence dealer and having it shipped out to the company for repair. An abnormal operation problem is either self-corrected by the energizer within a few minutes or the Gallagher dealer must be called and the energizer sent in for repair. And lastly an installation error is fixed by checking to see if the hot and ground wires were connected correctly; if they aren't unplug the energizer and switch the wires then plug the energizer back in.

The temporary fencing also needs to be checked to ensure that it is working properly and to make sure that it keeps the sheep in their temporary enclosure until they are moved to the next pasture. There are two types of temporary fencing that is used, net fence and poly wire. Net fence is a woven plastic wire fence that has metal running through the wires so that it can be powered by a portable energizer; while the poly wire is individual wires on spools that needs to be rolled

out and set up on fiberglass poles, an energizer can also be connected to this fence to power it. To check for problems in the temporary fence, test the fence with the fence tester to see what the voltage is. If the voltage is low, 2.0-0.1 kilo volts, or has a zero voltage there is something wrong. The first thing to check is the energizer/battery/solar panel connection to the fence, make sure all wires are properly connected; all the red wires are attached to the positive terminal on the battery and all the black wires are attached to the negative terminal. If there is nothing wrong with wire connections, look at the battery terminals and see if they are clean and have no dirt or corrosion build up on them; the batteries terminals can be clean by turning off the energizer, removing the wires from the terminals and scraping off the dirt or corrosion from the terminal and then reconnect all the wires again. Another thing that could be wrong with the battery is it doesn't have enough water in it or it can't keep a charge. If the water is low, fill it back up again with distilled water found in the barn and if it is not charged take the battery back to the barn and set up the battery charger and let it charge for 12 hours before trying to use it again. The only other problem there could be if none of those solutions work is to push down excess vegetation away from the fence that may be shorting it out. In addition when using the net fence, check to make sure none of the wires are twisted around the poles that are embedded into it, this can short out the fence. After the issue has been fixed, reconnect all wires and turn on the energizer, then test the fence with the fence tester again to see if the voltage goes up; if the voltage does from what it was before then the problem was solved.

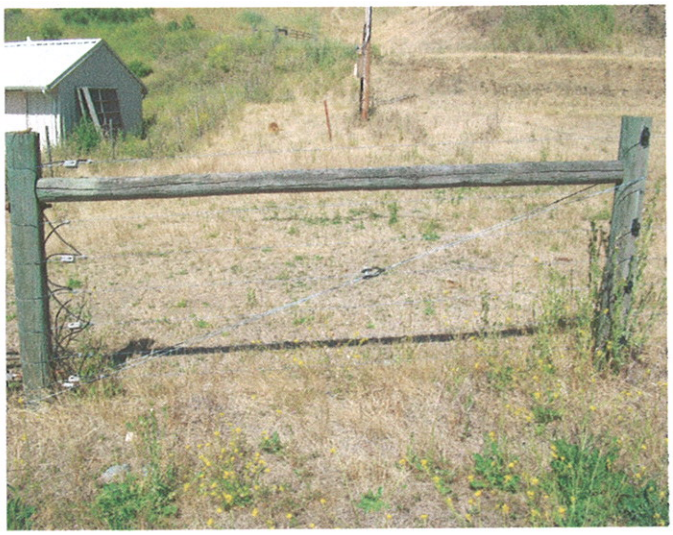

Figure 7: Permanent fence at H brace

Figure 8: Temporary net fence with energizer/battery/solar panel powering it

Figure 9: Temporary poly wire fence

Equipment at the sheep unit includes a pick-up, ATV and tractor. Their upkeep is important to ensure that the day to day operations of the unit are accomplished in a timely manner. Upkeep of the pick-up include making sure there is air in the tires and filling up the gas tank when it is running low on gas, all other maintenance repairs on the truck are done at the farm shop on campus. The pick-up is used to haul temporary fencing supplies to the pastures where it needs to be built, pick up things on campus, and to check on the sheep. ATV upkeep entails keeping the battery connections clean and the wires on the terminals tight, all other repairs or tune ups on it are done at the farm shop. The ATV is used to check on the sheep and to drag irrigation pipes across pastures. Tractor upkeep consists of keeping the battery terminals

clean and running it if it hasn't been used for an extended length of time, any other repairs that need to be made are done at the farm shop. The tractor is used to pull the pipe trailer that holds irrigation pipes between the Stenner Creek pastures and the Irrigated Creek pasture and can also be used to haul a small load of sheep to a different pasture with the trailer that we have at the unit.

References

1. American Sheep Industry Association, Inc. Sheep Production Handbook . Dever, CO: C&M Press, 2003.
2. Damerow, Gail. Barnyard in Your Backyard . Storey Publishing, 2002.
3. Mader, Sylvia S., Campbell, John R. Biololgy and Animal Sciences for Prinicles of Animal Science ASCI 112 Cal Poly State University. Boston: McGraw-Hill Companies, Inc., 2010.
4. Rutherford, Rob. ASCI 223 and Lambing Enterprise Notes. Winter Quarter 2010.
5. Senger, P.L. Pathways to Pregnacy and Parturition . Pullman,Washington: Current Conceptions, Inc., 2005.
6. Shapiro, Leland S. Introduction to Animal Science . Upper Saddle River, New Jersey: Prentice Hall, 2001.